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28 FEB 2005

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Cardiff Road  
Newport  
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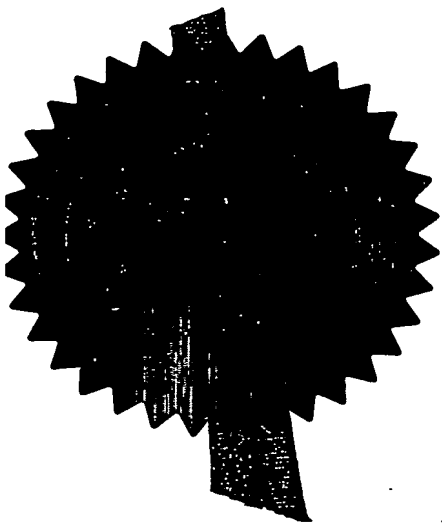
I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

I also certify that the attached copy of the request for grant of a Patent (Form 1/77) bears an amendment, effected by this office, following a request by the applicant and agreed to by the Comptroller-General.

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Signed

*Stephen Hordley*

Dated

25 September 2003

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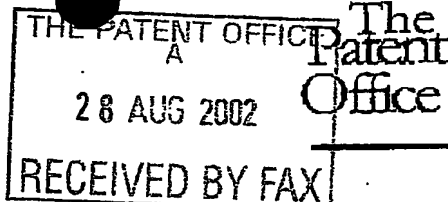
Gb0219942.0

By virtue of a direction given under Section 30 of the Patents Act 1977, the application is proceeding in the name of

CASTOR TECHNOLOGY LTD,  
Monacuan House,  
Clarendon Street,  
HYDE,  
Cheshire,  
SK14 2EP,  
United Kingdom

[ADP No. 08489650001]

## Patents Form 1/77

Patent Act 1977  
(Rule 16)28AUG02 E744101- D00268  
P01/7700 0.00-0219942.0

## Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form).

The Patent Office

Cardiff Road  
Newport  
Gwent NP9 1RH

1.	Your reference	EAL/4H-P/6397.GBA P 3A/C 089308PGB		
2.	Patent application number (The Patent Office will fill in this part)	28 AUG 2002 0219942.0		
3.	Full name, address and postcode of the or of each applicant (underline all surnames)	ALAN FOSTER 1 Fauvel Place Fauvel Road Glosport GL13 7AR SECTION 30 (2) APPLICATION FILED 10/11/02		
Patents ADP number (if you know it)		08453458001		
If the applicant is a corporate body, give the country/state of its incorporation				
4.	Title of the invention	CASTOR etc		
5.	Name of your agent (if you have one)	Hulse & Co		
	"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)	St James House, 8th Floor Vicar Lane Sheffield S1 2EX Marks & Clerk Sussex House 63-65 Mosley Street MANCHESTER M2 3LS		
	Patents ADP number (if you know it)	085002		
6.	If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number	Country	Priority application number (if you know it)	Date of filing (day/month/year)
7.	If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application	Date of filing (day/month/year)	
8.	Is a statement of inventorship and the right to grant of a patent required in support of this request? (Answer 'Yes' if: a) any applicant named in part 3 is not an inventor, or b) there is an inventor who is not named as an applicant, or c) any named applicant is a corporate body. See note (d))	NO		

## Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description 4  
 Claim(s) - DM  
 Abstract -  
 Drawing(s) 1 (Informal)

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of Invention and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/99)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11.

I/We request the grant of patent on the basis of this application

Signature

Date

28 August 2000

AS AGENTS FOR THE APPLICANT

12. Name and daytime telephone number of person to contact in the United Kingdom

Mr E A LONG  
 (0114) 276 9381

## Warning

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## Notes

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- e) Once you have filled in the form you must remember to sign and date it.
- f) For details of the fee and ways to pay please contact the Patent Office.

**Title of the Invention**

Castor etc

**Field of the Invention**

This invention relates to a support structure for a castor; to a castor provided with such a support structure; and to a manually movable castored trolley such as a supermarket trolley, a roll container, a hospital trolley etc.

**5 Background of the Invention**

The majority of such trolleys, intended for the transporting of goods or persons are normally provided with four castors, each freely rotatable through 360°, which frequently leads to steering difficulties, either during required straight line movement, or when negotiating a corner or bend.

10 With a view to providing some steering control it is known to restrain the freedom of rotation of a castor by means of a spring loaded pin engaging a recess, but such control proposals have been subject to minimal adoption.

**Object of the Invention**

15 A basic object of the present invention is the provision of an improved support structure for a castor; and consequently an improved castor and improved castored trolley.

**Summary of a first aspect of the Invention**

20 According to a first aspect of the present invention, there is provided a support

structure for a castor, comprising:

- (i) first and second plates located in co-axial, spaced apart relationship so as to provide mutually facing surfaces;
- (ii) bearing means located between the plates whereby one plate is rotatable with respect to the other plate; and
- (iii) one component of at least one pair of co-operable components being mounted on each plate, at least one of which pair of components is a permanent magnet adapted, in one angular position of the rotary plate with respect to the non-rotary plate, to be brought into registration, with a relatively small air gap between adjacent surfaces of the two co-operable components, to create a magnetic flux that, up to a certain torque restrains rotation, and in other angular positions without registration permits free rotation unless and until re-registration occurs.

#### **Advantages of the Invention**

When the co-operable components are in register ie aligned opposite one another, the magnetic flux restrains rotation of the rotatable disc so that, when applied to a castor of a supermarket trolley, directional stability is achieved assisting steering of the trolley. Also, due to the use of magnetic flux to restrain rotation, there are no contact faces and no parts subject to wear. Clearly, the torque required to exceed the magnetic flux is a factor of the surface area of the magnet(s), and the air gap.

#### **Summary of a second aspect of the Invention**

According to a second aspect of the Invention there is provided a castor suitable for a manually movable trolley, with a support bracket from the castor fixed to the rotary

plate of the support structure of the first aspect.

### Summary of a third aspect of the invention

According to a third aspect of the invention, there is provided a manually  
5 movable trolley, provided with at least one, and preferably four castors in accordance  
with the second aspect.

### Preferred or optional features of the invention

The first and second plates are circular.

10 The pair of co-operable components are one permanent magnet and one ferro-  
magnetic element.

The pair of co-operable components are two permanent magnets.

Two pairs of co-operable components are provided, located 180° apart.

The permanent magnet(s) is/are disc magnets.

15 The ferro-magnetic element is of steel.

The ferro-magnetic element is a disc.

A roller bearing is provided between the first plate and the second plate.

At least one component of the or each pair of co-operable components is  
secured to its plate by a screw means which additionally provides for air gap  
20 adjustment.

The co-operable components are arcuate, and extend over a limited area in the  
form of a predetermined quadrant eg <90°, of each plate, in which case the ferro-  
magnetic element eg of steel, is also arcuate, or the second permanent magnet is also  
arcuate.

An annular skirt extends from one plate toward the other plate to shroud the other plate.

A support bracket from a castor wheel is attached to the rotatable plate.

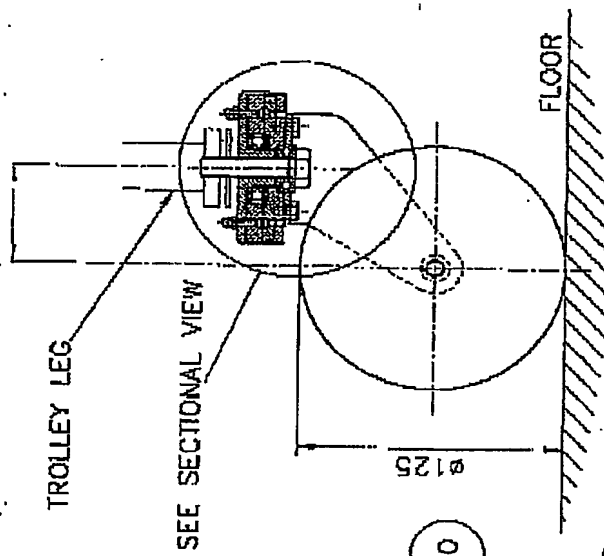
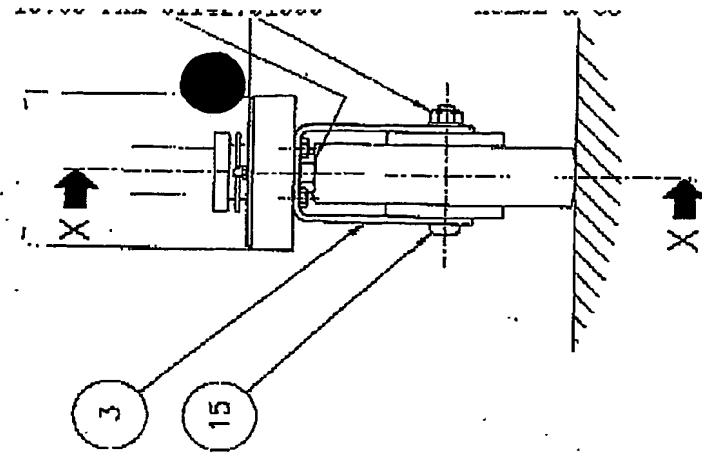
The support bracket is U-shaped.

5 The non-rotatable plate is attached to a trolley eg to a leg of a supermarket trolley, by a bolt, the head of which engages an outer surface of the rotatable plate via a second ball bearing.

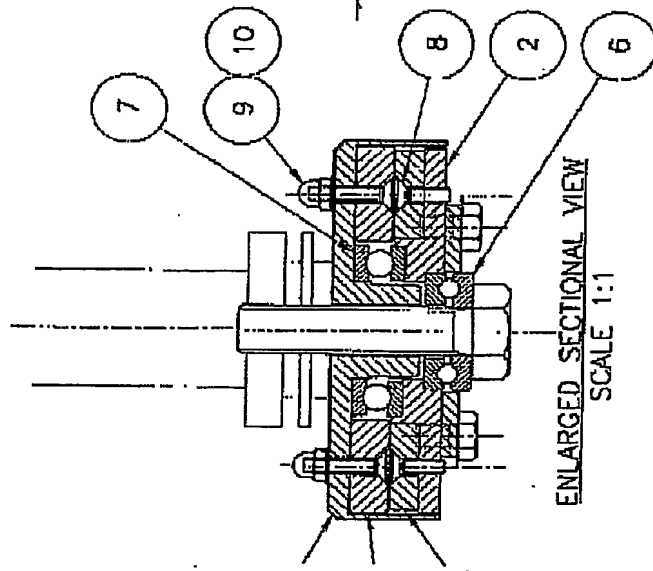
### Drawings

10 The accompanying drawings show, by way of example only, a support structure in accordance with the first aspect; a castor in accordance with the second aspect; and a portion of a trolley in accordance with the third aspect.





SECTION ON 'X-X'



ENLARGED SECTIONAL VIEW  
SCALE 1:1

FOR PARTS LIST REF  
1215/006-1

THE PATENT OFFICE

25 SEP 2003

Received in Patents  
International Unit

PCT Application

**GB0303700**



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